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EXAMINER

PIAZZA CORCORAN, GLADYS JOSEFINA

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 11/07/2002

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/930,007

Applicant(s)

OTTER, JAMES WILLIAM

Examiner

Gladys J Piazza Corcoran

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 and 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, Species IA, expanding an inner extruded tube with air in a mold to form an inner expanded tube and expanding an outer extruded tube with air in a mold to form a substantially U-shaped outer expanded mold where the ends of the tubes are thermally adhered to a norbornene flange to form one of the cells, in Paper No. 7 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 7-9 and 12-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group II, Species IB, II and III, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Claim Objections

3. Claim 4 is objected to because of the following informalities: Claim 4, line 2 recites, "a plurality of tubes grooves". It is suggested to amend to --a plurality of tube grooves--.
- Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims ^{3, 4, 5, 10} 10, 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. The terms "inner" and "outer" in claims 3, 4, 5, 6, 10, 11 are relative terms which renders the claim indefinite. The terms "inner" and "outer" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The claims are unclear because it is unknown what the terms inner and outer are referring to. For example, Inner and outer tubes with respect to each other or with respect to each cell or with respect to placement in the heat transfer component. Or, inner mold and outer mold, are these with respect to each other or with respect to what piece of tube they are molding. Or, inner end of the inner expanded tube and a pair of outer ends of the outer expanded tube, is this with respect to which tube the ends are from or with respect to the tube itself or with respect to the placement of the ends on the flange.

7. Claim 10 is unclear by reciting, "melting a norbornene polymer; hot extruding an inner extruded tube and an outer extruded tube." There is no recitation that the melted norbornene polymer is the material that is used for the hot extrusion step. However, if the melted norbornene polymer is not used for the hot extrusion step, then it is unclear what the melted norbornene polymer is used for. It is suggested to recite, -- melting a norbornene polymer; hot extruding said melted norbornene polymer to form an inner extruded tube and an outer extruded tube--.

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8. Claim 10 recites the limitation "said plurality of mold grooves" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to --a plurality of mold grooves--. It is noted that this recitation of the mold grooves refers to those in the outer mold, where the only prior recitation of mold grooves referred to those in the inner mold.

9. Claim 10 recites the limitation "said plurality of tube grooves" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to --a plurality of tube grooves--. It is noted that this recitation of the tube grooves refers to those in the outer expanded tube, where the only prior recitation of tube grooves referred to those in the inner expanded tube.

10. Claim 10 is unclear by reciting in line 10, "to form one of at least one cell". It is suggested to amend to --to form at least one cell--.

11. Claim 10 recites the limitation "said inner expanded outer tube and said expanded tube" in lines 12-13. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to --said inner expanded tube and said outer expanded tube--.

12. Claim 10 is unclear by reciting in lines 9-10, "attaching an inner end of said inner expanded tube and a pair of outer ends of said outer expanded tube to a flange to form one of at least one cell" and then reciting in line 14, "attaching said at least one cell to said flange." The flange is considered part of the cell and is already attached to the inner and outer expanded tubes to form the cell. It is impossible to further attach the

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flange to the cell when the flange is already attached and considered part of the cell. It is suggested to amend line 14 to recite, "where an air flow passage being defined".

13. Claim 10 is also unclear by reciting "an air flow passage being defined between each of said at least one cell." It is unclear whether the air flow passage is defined within each cell by itself or between the cells. If the air flow passage is between the cells, then at least 2 cells must be defined. If the air flow passage is between the tubes within each cell then such clarification is required. This also seems to be a repetition of the limitation in lines 12 and 13, "a flue gas passage containing a flue gas being defined between said inner expanded [] tube and said [outer] expanded tube."

14. Claim 10 recites the limitation "said flue gas passage" in lines 15-16. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to -said air flow passage--.

15. Claim 11 is unclear by reciting, "said flange is made of said norbornene polymer." This appears to claim that the flange is made from the same norbornene polymer that is melted in claim 10 and appears to form the tubes. It is suggested to clarify by reciting, "said flange is made of a norbornene polymer".

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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17. Claims 1, 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher et al. (US Patent No. 5,078,946) in view of Ueno et al. (US Patent No. 5,098,750).

Fletcher discloses a method for making a heat transfer component (article 1) by forming a plurality of cells of a polymer and using the cells as part of a heat transfer component (column 1, lines 48-62; column 7, lines 4-19).

Fletcher discloses that the polymer in the automotive heat transfer component (column 1, lines 33-47) may be chosen from a variety of polymers suitable for the particular end heat transfer component (column 7, lines 60-65; column 9, lines 3-12). Ueno discloses it is known to use norbornene polymers for molding parts in the automotive industry (column 2, lines 62-63; column 6, lines 7-11, 35-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to one of ordinary skill in the art forming the heat transfer component of Fletcher to use a well known and commercially available polymer such as norbornene particularly since it is known in the automotive industry to use norbornene polymers for molding automotive parts. Only the expected results would be attained.

As to claim 2, Fletcher discloses melting the polymer to form the tubes. It appears as though Fletcher discloses injection molding the polymer to form the tubes, however, extrusion molding tubes is a conventional and well known equivalent alternative to injection molding tubes. It is furthermore also well known to extrude polymeric material when injection molding. It would have been obvious to one of ordinary skill in the art at the time of the invention to mold the tubes in Fletcher by an

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extrusion method as it is considered a well known equivalent alternative to injection molding tubes.

18. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher et al. in view of Ueno et al. as applied to claim 1 above, and further in view of Ninomiya et al. (US Patent No. 5,525,288).

Fletcher discloses melting the polymer to form the tubes. It appears as though Fletcher discloses injection molding the polymer to form the tubes, however, extrusion molding tubes is a conventional and well known equivalent alternative to injection molding tubes. For example, Ninomiya discloses it is known in the polymer molding art, particularly the automotive art for forming tubes, to extrude tubes prior to expansion molding the tubes to the final shape as an improvement over the prior art methods including injection molding the tubes (column 1, lines 10-33, column 3, line 65). It would have been obvious to one of ordinary skill in the art at the time of the invention to mold the tubes in Fletcher by an extrusion method as it is considered a well known equivalent alternative to injection molding tubes and further exemplified by Ninomiya as an improvement for molding tubes.

19. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripka et al. (US Patent No. 5,038,750) in view of Fletcher et al. (US Patent No. 5,078,946) in view of Ueno et al. (US Patent No. 5,098,750) as further taken with Ninomiya et al. (US Patent No. 5,525,288) and Taga (US Patent No. 3,425,092).

Ripka discloses a heat transfer component with inner tubes (straight pipe 201b) and outer U-shaped tubes (pipe 201a). Ripka discloses the placement of the tubes with

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the upper tubes being straight and the lower tubes being U-shaped to accommodate the radiant burner 15 (column 4, lines 33-55). The terms inner and outer are unclear as discussed above. In Ripka it is considered that at least some of the straight tubes are considered more inward with respect to the heat exchanger as a whole as compared to at least some of the U-shaped tubes. It can also be considered as the upper area of the heat exchanger to be more inward than the lower area of the heat exchanger with respect to where the heat exchanger is placed and thus the straight tubes would be more inward than the U-shaped tubes.

Ripka discloses the heat transfer component is formed of suitable materials including copper and aluminum (column 6, lines 39-53). Fletcher discloses that in a method for making a heat transfer component (article 1) by forming a plurality of cells and using the cells as part of a heat transfer component where a polymer material is used for forming the cells instead of a metal in order to reduce the weight of the heat exchanger (column 1, lines 24-32, 48-62; column 7, lines 4-19). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method of forming a heat transfer component as shown by Ripka out of a polymer material that is formed into a plurality of cells to form the heat transfer component as shown in Fletcher in order to provide a lighter weight component.

Fletcher discloses that the polymer in the automotive heat transfer component (column 1, lines 33-47) may be chosen from a variety of polymers suitable for the particular end heat transfer component (column 7, lines 60-65; column 9, lines 3-12). Ueno discloses it is known to use norbornene polymers for molding parts in the

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automotive industry (column 2, lines 62-63; column 6, lines 7-11, 35-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to one of ordinary skill in the art forming the heat transfer component of Ripka and Fletcher to use a well known and commercially available polymer such as norbornene particularly since it is known in the automotive industry to use norbornene polymers for molding automotive parts. Only the expected results would be attained.

As to claim 2, Fletcher discloses melting the polymer to form the tubes. It appears as though Fletcher discloses injection molding the polymer to form the tubes, however, extrusion molding tubes is a conventional and well known equivalent alternative to injection molding tubes. For example, Ninomiya discloses it is known in the polymer molding art, particularly the automotive art for forming tubes, to extrude tubes prior to expansion molding the tubes to the final shape as an improvement over the prior art methods including injection molding the tubes (column 1, lines 10-33, column 3, line 65). Taga shows another example in the art where it is known to extrusion mold tubes as an improvement over injection molding tubes, particularly when forming U-shaped tubes (column 1, lines 1-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to mold the tubes in Ripka and Fletcher by an extrusion method as it is considered a well known equivalent alternative to injection molding tubes and further exemplified by Ninomiya and Taga as an improvement for molding tubes.

As to claim 3, Ripka discloses inner tubes and U-shaped outer tubes. Fletcher discloses that when the polymeric tubes are formed, they are expanded in the molds to

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form the proper shape (column 5, lines 23-54). Ninomiya and Taga also disclose examples of extruded polymeric tubes that are expanded in molds to form the final shape. As to the fact that the tubes are molded in an inner mold and an outer mold, it is considered that the mold that forms the inner tube is called an inner mold because of the tube it forms and likewise with the outer tube and mold. Because the terms inner and outer are relative, it is unclear whether Applicant is attempting to claim that the inner mold is physically inward to the outer mold. If this were claimed, it is noted that Fletcher discloses that the tubes are molded in orientation to each other, thus if an inner tube were formed, the mold would be an inner mold and likewise with the outer tube and mold.

As to claim 4, Fletcher discloses that the tubes have external surface discontinuities such as dimples, protrusions, etc. in order to provide turbulence to the fluid (column 7, lines 39-50). Fletcher does not specifically disclose how the discontinuities are formed, however it would have been well within the purview of one of ordinary skill in the art to mold the discontinuities during the molding step of the tubes by forming grooves into the molds to form the desired outer surface of the tubes. Only the expected results would be attained. Furthermore, Ninomiya discloses it is known in the tube forming art to provide grooves on the mold surfaces when extrusion molding tubes in order to provide surface discontinuities on the tubes (column 2, lines 25-43; column 3, lines 37-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the tubes formed in heat transfer component as shown by Ripka and Fletcher with tube grooves as shown in Fletcher in order to provide

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turbulence to the fluid by providing a plurality of mold grooves in the molds as is well within the purview of one of ordinary skill in the art and well known in the art as exemplified by Ninomiya.

20. Claims 5, 6, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripka et al. in view of Fletcher et al. in view of Ueno et al. as further taken with Ninomiya et al. and Taga as applied to claims 3 and 4 above, and further in view of Larinoff (US Patent No. 5,787,970).

Ripka and Fletcher disclose attaching the tubes of the heat transfer component to a flange and a flue gas passage between the tubes. Larinoff discloses it is known in the heat transfer component art to provide cells of tubes where the tube configuration is of a U-shaped tube surrounding or outwardly of a straight tube which is positioned in an opening between the ends of the U shaped tube (column 9, lines 15-20; see figure 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the heat transfer component of Ripka and Fletcher by attaching the tubes in a cell in the configuration of the straight tube positioned in an opening between the ends of the U shaped tube as it is a known cell configuration in the heat transfer component art and exemplified by Larinoff.

As to claim 10, all the limitations are discussed in reference to claims 4 and 5 above. As to claims 6 and 11, Fletcher discloses the flange is thermally adhered during molding and the orientation step to the polymer tubes and is made of the same polymer as the tubes (column 4, lines 55-59; column 5, lines 9-22; column 7, lines 50-60). It would have been obvious to one of ordinary skill in the art at the time of the invention to

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manufacture the heat transfer component as shown in Ripka, Fletcher, and Ueno with a flange of norbornene polymer since Fletcher discloses forming the flange out of the same material as the tubes and thermally adhered to the tubes.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gladys J Piazza Corcoran whose telephone number is (703) 305-1271. The examiner can normally be reached on M-F 8am-5:30pm (alternate Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Gladys JP Corcoran
November 1, 2002


Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700